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“New constraint on gravity theory at $z \sim 1.4$ from the Subaru FMOS galaxy redshift survey (FastSound)”

奥村哲平 (東京大学 (Kavli IPMU))

I will present a cosmological result obtained from a spectroscopic sample of ~ 2800 emission line galaxies from the FastSound survey. The survey, which uses the Subaru Telescope and covers the redshift ranges of $1.19 \leq z \leq 1.55$, is the first cosmological study at such high redshifts. We measure the redshift-space correlation function from the emission line galaxies, and detect clear anisotropy due to redshift-space distortions (RSD) both in the correlation function as a function of separations parallel and perpendicular to the line of sight and its quadrupole moment. RSD has been extensively used to test general relativity on cosmological scales at $z \leq 1$. Adopting a Λ CDM cosmology, and using the RSD measurements on scales above 8 Mpc/h, we obtain the first constraint on the growth rate at the redshift $f(z)\sigma_8(z) = 0.482$ with 25 % error at $z \sim 1.4$, after marginalizing over the galaxy bias parameter. Our constraint is consistent with the prediction of general relativity $f(z)\sigma_8(z) \sim 0.392$ within the $1\text{-}\sigma$ confidence level. We also demonstrate that by combining with the low- z constraints on $f(z)\sigma_8(z)$, high- z galaxy surveys like the FastSound can be useful to distinguish modified gravity models without relying on CMB anisotropy experiments.